

Virginia Department of Environmental Quality

# VURAM

Virginia Unified Risk Assessment Model

VERSION: 1.11

## Residential Calculated Hazard/Risk Report Total Hazard/Risk for All Media

Non-Cancer Adult	Non-Cancer Child	Cancer
Total: 8.31E+01	Total: 8.31E+01	Total: 1.70E-03
<i>Hazard Exceeded!</i>	<i>Hazard Exceeded!</i>	<i>Risk Exceeded!</i>

All Report Pages are Required for Risk Assessment Submission

DETAILED REPORT FOLLOWS

**Program: Voluntary Remediation Program (VRP)**Risk Based Performance CriteriaDefault Hazard Index  
1.00E+00Default Risk for Each Chemical  
1.00E-05Default Risk for All Chemicals  
1.00E-04**Air****Analyte: Benzene****CAS: 71-43-2**

Concentration:	1.00E+02	ug/m3	Calculated Hazard/Risk Values		
			Non-Cancer Adult	Non-Cancer Child	Cancer
RfDo:					
RfCi:	3.00E-02	Ingestion:		Ingestion:	Ingestion:
SFO:		Dermal:		Dermal:	Dermal:
IUR:	7.80E-06	Inhalation:	3.20E+00	Inhalation:	3.20E+00
Mutagen:		Total:	3.20E+00	Total:	3.20E+00
		% Contribution to Media Hazard/Risk	3.85%	3.85%	16.36%

<b>Hazard Exceeded Risk Exceeded!</b>	ug/m3	Non-Cancer Adult	Non-Cancer Child	Cancer
Recommended Acceptable Concentration		3.13E+01	3.13E+01	3.60E+00

**Analyte: Naphthalene****CAS: 91-20-3**

Concentration:	1.00E+02	ug/m3	Calculated Hazard/Risk Values		
			Non-Cancer Adult	Non-Cancer Child	Cancer
RfDo:					
RfCi:	3.00E-03	Ingestion:		Ingestion:	Ingestion:
SFO:		Dermal:		Dermal:	Dermal:
IUR:	3.40E-05	Inhalation:	3.20E+01	Inhalation:	3.20E+01
Mutagen:		Total:	3.20E+01	Total:	3.20E+01
		% Contribution to Media Hazard/Risk	38.46%	38.46%	71.32%

<b>Hazard Exceeded Risk Exceeded!</b>	ug/m3	Non-Cancer Adult	Non-Cancer Child	Cancer
Recommended Acceptable Concentration		3.13E+00	3.13E+00	8.26E-01

**Analyte: Trichloroethylene****CAS: 79-01-6**

Concentration:	1.00E+02	ug/m3	Calculated Hazard/Risk Values		
			Non-Cancer Adult	Non-Cancer Child	Cancer
RfDo:					
RfCi:	2.00E-03	Ingestion:		Ingestion:	Ingestion:
SFO:		Dermal:		Dermal:	Dermal:
IUR:	4.10E-06	Inhalation:	4.79E+01	Inhalation:	4.79E+01
Mutagen:	Y	Total:	4.79E+01	Total:	4.79E+01
		% Contribution to Media Hazard/Risk	57.69%	57.69%	12.31%

<b>Hazard Exceeded Risk Exceeded!</b>	ug/m3	Non-Cancer Adult	Non-Cancer Child	Cancer
Recommended Acceptable Concentration		2.09E+00	2.09E+00	4.78E+00

**Program: Voluntary Remediation Program (VRP)**

Risk Based Performance Criteria

Default Hazard Index

1.00E+00

Default Risk for Each Chemical

1.00E-05

Default Risk for All Chemicals

1.00E-04

**Air**

**Total Calculated Hazard/Risk For Media: Air**

**Non-Cancer Adult**

Ingestion: 0.00E+00

Dermal: 0.00E+00

Inhalation: 8.31E+01

**Total: 8.31E+01**

**Non-Cancer Child**

Ingestion: 0.00E+00

Dermal: 0.00E+00

Inhalation: 8.31E+01

**Total: 8.31E+01**

**Cancer**

Ingestion: 0.00E+00

Dermal: 0.00E+00

Inhalation: 1.70E-03

**Total: 1.70E-03**

**Program: Voluntary Remediation Program (VRP)**

Risk Based Performance Criteria

Default Hazard Index  
1.00E+00

Default Risk for Each Chemical  
1.00E-05

Default Risk for All Chemicals  
1.00E-04

## Total Hazard/Risk for All Media

**Non-Cancer Adult**

Ingestion: 0.00E+00  
Dermal: 0.00E+00  
Inhalation: 8.31E+01

**Total: 8.31E+01**  
***Hazard Exceeded!***

**Non-Cancer Child**

Ingestion:: 0.00E+00  
Dermal: 0.00E+00  
Inhalation: 8.31E+01

**Total: 8.31E+01**  
***Hazard Exceeded!***

**Cancer**

Ingestion:: 0.00E+00  
Dermal: 0.00E+00  
Inhalation: 1.70E-03

**Total: 1.70E-03**  
***Risk Exceeded!***

**Program: Voluntary Remediation Program (VRP)**

Risk Based Performance Criteria

Default Hazard Index  
1.00E+00

Default Risk for Each Chemical  
1.00E-05

Default Risk for All Chemicals  
1.00E-04

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Exposure Defaults Follow

**Program: Voluntary Remediation Program (VRP)**Risk Based Performance Criteria

Default Hazard Index

1.00E+00

Default Risk for Each Chemical

1.00E-05

Default Risk for All Chemicals

1.00E-04

# Residential Exposure Default Values

Description	Value
Residential Soil Adherence Factor - adult (mg/cm2)	0.07
Residential Soil adherence Factor - child (mg/cm2)	0.2
Residential Averaging Time (days/yr)	365
Residential Body Weight - adult (kg)	80
Residential Body Weight - child (kg)	15
Residential Soil Mutagenic Dermal Contact Factor - age adjusted (mg/kg)	428260
Residential Soil Dermal Contact Factor - age adjusted (mg/kg)	103390
Residential Groundwater Mutagenic Dermal Contact Factor - age adjusted (cm2-event/kg)	8191633
Residential Groundwater Dermal Contact Factor - age adjusted (cm2-event/kg)	2610650
Residential Total Exposure Duration - child + adult (yr)	26
Residential Exposure Duration - adult (yr)	20
Residential Exposure Duration - child (yr)	6
Residential Exposure Frequency (days/yr)	350
Residential Exposure Frequency - adult (days/yr)	350
Residential Exposure Frequency - child (days/yr)	350
Residential Air Inhalation Exposure Time (hrs/day)	24
Residential Exposure Time - adult (hrs/day)	24
Residential Exposure Time - child (hrs/day)	24
Residential Groundwater Exposure Time -adult (hr/event)	0.71
Residential Groundwater Exposure Time -age adjusted (hr/event)	0.6708
Residential Groundwater Exposure Time - child (hr/event)	0.54
Residential Groundwater Inhalation Exposure Time (hrs/day)	24
Residential Soil Exposure Time (hrs/day)	24
Residential Groundwater Events (event/day)	1

**Program: Voluntary Remediation Program (VRP)**Risk Based Performance Criteria

Default Hazard Index	Default Risk for Each Chemical	Default Risk for All Chemicals
1.00E+00	1.00E-05	1.00E-04
Residential Mutagenic Drinking Groundwater Ingestion Rate - age adjusted (L/kg)		1019.9
Residential Mutagenic Soil Ingestion Rate - age adjusted (mg-yr/kg-day)		166833.33
Residential Drinking Groundwater Ingestion Rate - age adjusted (L/kg)		327.95
Residential Soil Ingestion Rate - age adjusted (mg-yr/kg-day)		36750
Residential Air Inhalation Exposure Duration Mutagen Calculated - age adjusted (hr)		604800
Residential Groundwater Inhalation Exposure Duration Mutagen Calculated - age adjusted (d		25200
Residential Soil Inhalation Exposure Duration Mutagen Calculated - age adjusted (days)		25200
Residential Food Eggs Ingestion Rate (mg/day)		150000
Residential Food Fish/Shellfish Ingestion Rate (mg/day)		54000
Residential Food Fruit/Vegetables Ingestion Rate (mg/day)		122000
Residential Food Meat/Dairy (mg/day)		280000
Residential Soil Ingestion Rate - adult (mg/day)		100
Residential Soil Ingestion Rate - child (mg/day)		200
Residential Drinking Groundwater Ingestion Rate - adult (L/day)		2.5
Residential Drinking Groundwater Ingestion Rate - child (L/day)		0.78
LifeTime Residential/Industrial/Construction/Recreator/Trespasser (yrs)		70
Residential Soil Surface Area - adult (cm2/day)		6032
Residential Soil Surface Area -child (cm2/day)		2373
Residential Water Surface Area - adult (cm2/day)		19652
Residential Water Surface Area -child (cm2/day)		6365